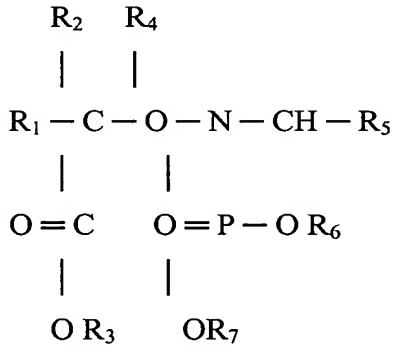
IN THE CLAIMS

Please amend the claims as follows:

Claim 1 (Currently Amended): ~~The use, as dispersant and/or grinding aid agent for~~ A process comprising adding to pigments and/or mineral fillers in aqueous suspension, [[of]] to function as a dispersant and/or a grinding aid agent a water soluble polymer, ~~characterized in that~~ wherein said water soluble polymer has a controlled structure and is obtained by a controlled free radical polymerization method employing, as polymerization initiator, a particular alkoxyamine with the general formula (A):



where:

[[-]] R_1 and R_2 represent a linear or branched alkyl radical, with 1 to 5 carbon atoms,

[[-]] R_3 is a hydrogen atom, a linear or branched alkyl radical with 1 to 8 carbon atoms, a phenyl radical, a cation such as Li^+, Na^+, K^+, H_4N^+, Bu_3HN^+ with Bu = butyl,

[[-]] R_4 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical,

[[-]] R_5 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical, and

[[-]] R_6 and R_7 represent a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably an ethyl radical.

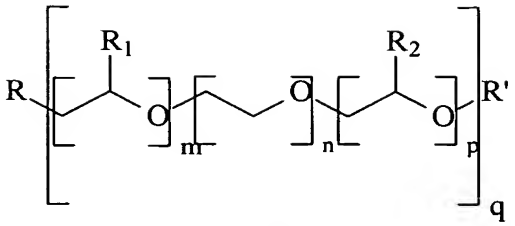
Claim 2 (Currently Amended): The ~~use, as dispersant and/or grinding aid agent for pigments and/or mineral fillers in aqueous suspension, of the water soluble polymer~~ process according to claim 1, ~~characterized in that~~ wherein R_1 and R_2 represent the methyl radical and R_3 is the hydrogen atom.

Claim 3 (Currently Amended): The ~~use, as dispersant and/or grinding aid agent for pigments and/or mineral fillers in aqueous suspension, of the water soluble polymer~~ process according to ~~any one of claims 1 or 2, characterized in that~~ claim 1, wherein said polymer is a water soluble copolymer and has a random, block, comb, graft, or alternating type of structure.

Claim 4 (Currently Amended): The ~~use, as dispersant and/or grinding aid agent for pigments and/or mineral fillers in aqueous suspension, of the water soluble polymer~~ process according to ~~any one of claims 1 to 3, characterized in that~~ claim 1, wherein said water soluble polymer and/or copolymer is obtained by the controlled free radical polymerization of monomers selected from:

a) at least one ionic monomer, which is either
   i) anionic and with a carboxylic or dicarboxylic or phosphoric or phosphonic or sulfonic function or mixture thereof, or
   ii) cationic, or
   iii) the mixture of i) and ii)

b) and ~~possibly~~ optionally at least one nonionic monomer, the nonionic monomer consisting of at least one monomer with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer or mixtures thereof,

d) and ~~possibly~~ optionally at least one cross-linking monomer, or the mixture of a plurality of these monomers.

Claim 5 (Currently Amended): The ~~use, as dispersant and/or grinding aid agent for pigments and/or mineral fillers in aqueous suspension, of the water soluble polymer~~ process according to ~~any one of claims 1 to 4, characterized in that~~ claim 1, wherein said water soluble polymer and/or copolymer is obtained by the controlled free radical polymerization of monomers selected more particularly from:

a) at least one ionic monomer which is either

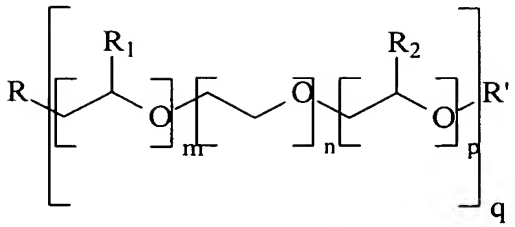
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or carboxylic acid anhydrides, such as maleic anhydride, or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-

methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl sulfonic acid and styrene sulfonic acid, or even selected from monomers with ethylenic unsaturation and with phosphoric function in the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) cationic selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers

b) and ~~possibly~~ optionally at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

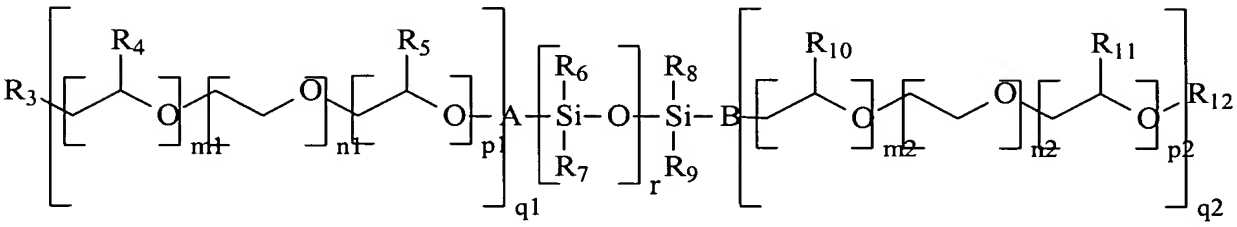
[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane,

allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms,

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si(OB)_3$$

where:

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

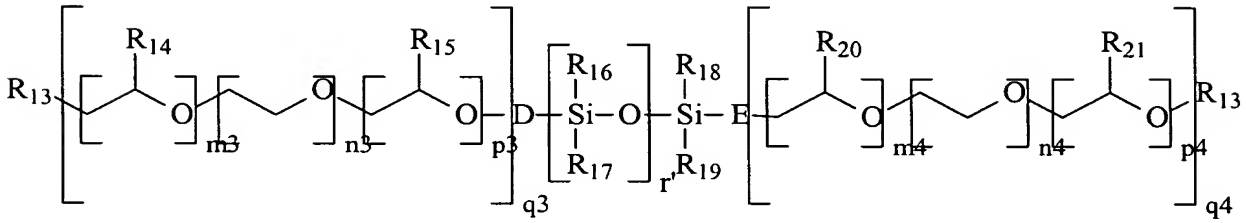
[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) and ~~possibly~~ optionally at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate,

trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III):



(III)

where :

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 6 (Currently Amended): The ~~use, as dispersant and/or grinding aid agent for pigments and/or mineral fillers, of the water soluble monomer~~ process according to ~~one of claims 1 to 5, characterized in that~~ claim 1, wherein said polymer consists of, expressed by weight:

a) 2% to 100% and even more particularly 5% to 100% of at least one ionic monomer, which is either

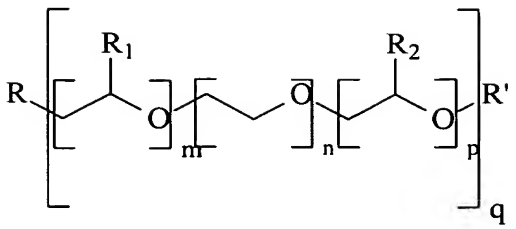
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or carboxylic acid anhydrides, such as maleic anhydride or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl

sulfonic acid and styrene sulfonic acid, or even selected from monomers with ethylenic unsaturation and with phosphoric function in the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) cationic selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers,

b) 0 to 98% and even or particularly 0% to 96% of at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

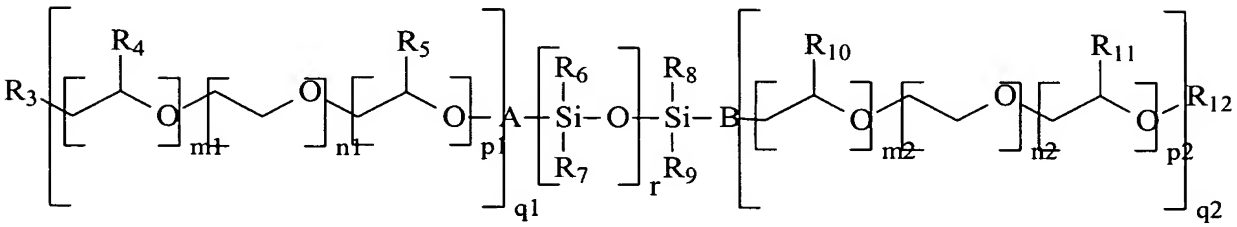
[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) 0% to 50% of at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the

alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms, and

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si(OB)_3$$

where:

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

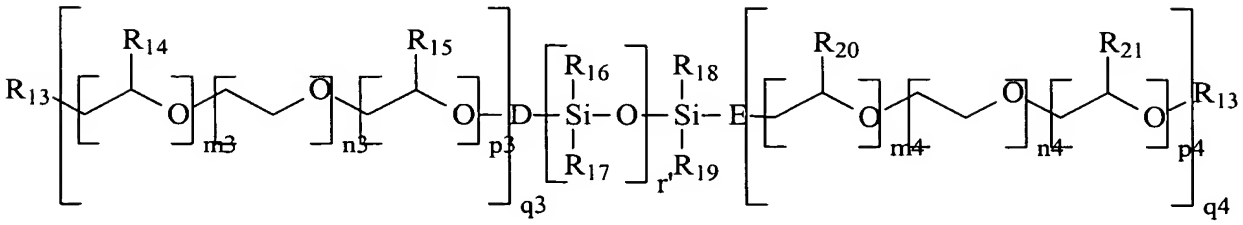
[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) 0 to 3% of at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained

from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III):



(III)

where:

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

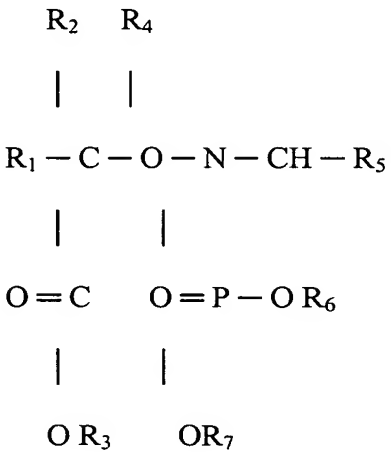
[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 7 (Currently Amended): A dispersant and/or grinding aid agent for pigments and/or mineral fillers in aqueous suspension, ~~characterized in that it is~~ comprising a water soluble polymer with a controlled structure ~~and is~~ obtained by a controlled free radical polymerization method employing, as polymerization initiator, a particular alkoxyamine with the general formula (A):



where:

[[-]] R_1 and R_2 represent a linear or branched alkyl radical, with 1 to 5 carbon atoms,

[[-]] R_3 is a hydrogen atom, a linear or branched alkyl radical with 1 to 8 carbon atoms, a phenyl radical, a cation such as Li^+, Na^+, K^+, H_4N^+, Bu_3HN^+ with Bu = butyl,

[[-]] R_4 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical, and

[[-]] R_5 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical, and

[[-]] R_6 and R_7 represent a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably an ethyl radical.

Claim 8 (Currently Amended): A dispersant for pigments and/or mineral fillers in aqueous suspension, ~~characterized in that~~ according to claim 7, wherein R_1 and R_2 represent the methyl radical and R_3 is the hydrogen atom.

Claim 9 (Currently Amended): The dispersant for pigments and/or mineral fillers in aqueous suspension, according to ~~either one of claims 7 or 8, characterized in that~~ claim 7, wherein said polymer is a water soluble copolymer and has a random, block, comb, graft, or alternating type of structure.

Claim 10 (Currently Amended): The dispersant for pigments and/or mineral fillers in aqueous suspension, according to ~~any one of claims 7 to 9, characterized in that~~ claim 7, wherein said water soluble polymer is obtained by the controlled free radical polymerization of monomers selected from:

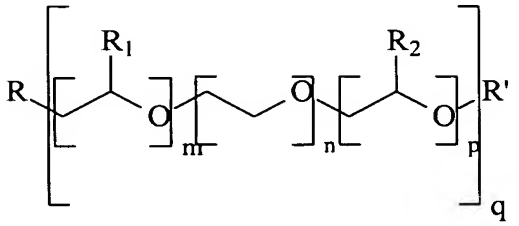
a) at least one ionic monomer, which is either

i) anionic and with a carboxylic or dicarboxylic or phosphoric or phosphonic or sulfonic function or mixture thereof, or

ii) cationic, or

iii) the mixture of i) and ii)

b) and ~~possibly~~ optionally at least one nonionic monomer, the nonionic monomer consisting of at least one monomer with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer or mixtures thereof,

d) and ~~possibly~~ optionally at least one cross-linking monomer, or the mixture of a plurality of these monomers.

Claim 11 (Currently Amended): The dispersant for pigments and/or mineral fillers in aqueous suspension, according to ~~any one of claims 7 to 10, characterized in that~~ claim 7, wherein said water soluble polymer is obtained by the controlled free radical polymerization of monomers selected more particularly from:

a) at least one ionic monomer which is either

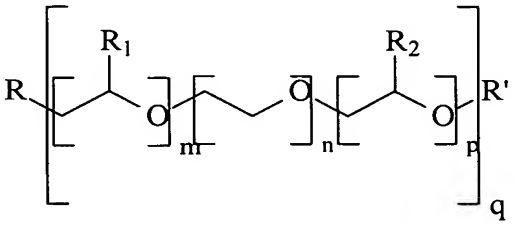
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic

acid, or carboxylic acid anhydrides, such as maleic anhydride or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl sulfonic acid and styrene sulfonic acid, or even selected from monomers with ethylenic unsaturation and with phosphoric function in the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) cationic selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers

b) and ~~possibly~~ optionally at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

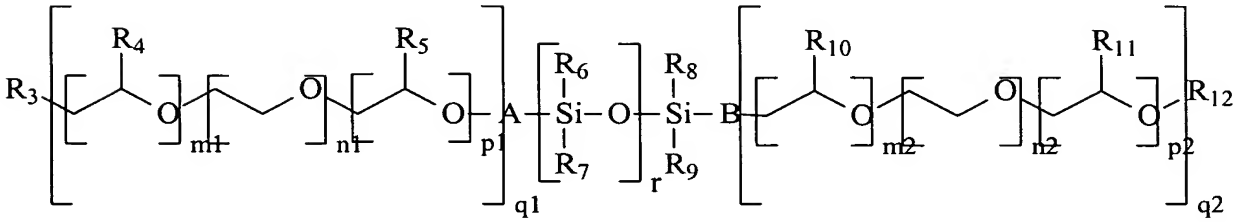
[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane,

methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms, and

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si\,(OB)_3$$

where:

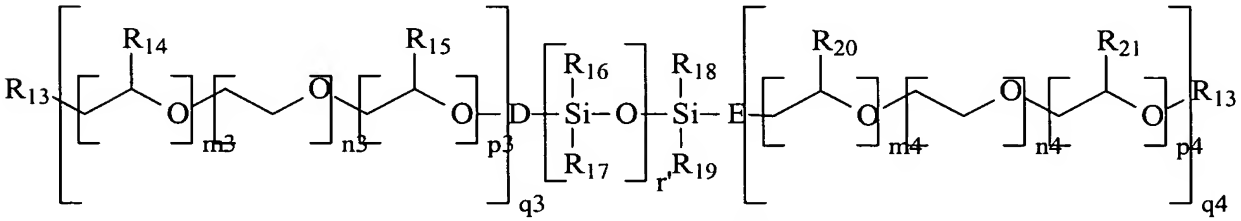
[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) and ~~possibly~~ optionally at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III) :



(III)

where:

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 12 (Currently Amended): The dispersant for pigments and/or mineral fillers, according to ~~one of claims 7 to 11, characterized in that~~ claim 7, wherein said water soluble polymer consists of, expressed by weight:

a) 2% to 100% and even more particularly 5% to 100% of at least one ionic monomer, which is either

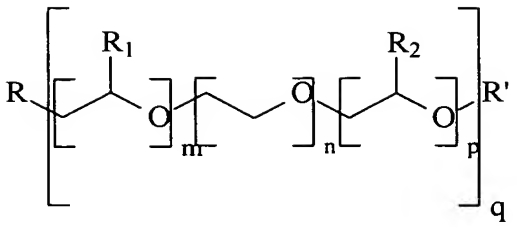
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or carboxylic acid anhydrides, such as maleic anhydride or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl sulfonic acid and styrene sulfonic acid, or even selected from

monomers with ethylenic unsaturation and with phosphoric function in the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers,

b) 0 to 98% and even or particularly 0 to 96% of at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

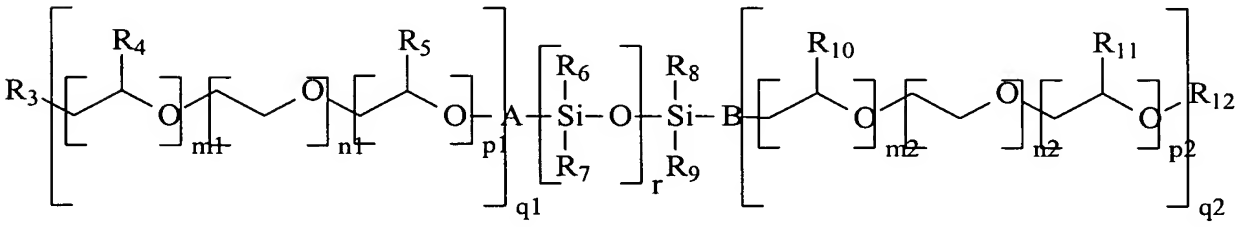
[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) 0% to 50% of at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane,

allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms, and

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si(OB)_3$$

where:

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

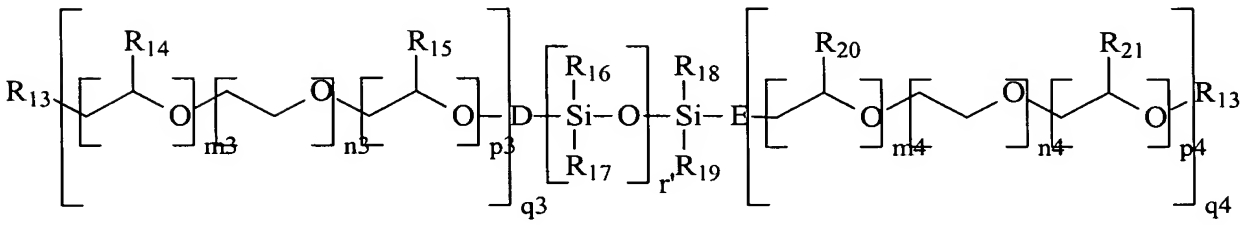
[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) 0 to 3% of at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate,

allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III):



(III)

where:

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

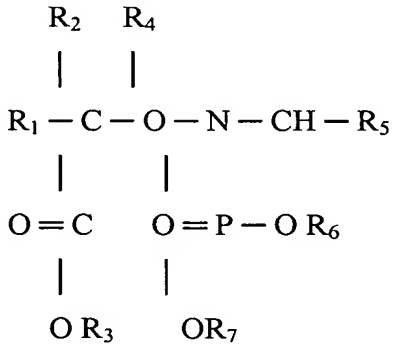
[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 13 (Currently Amended): A grinding aid agent for pigments and/or mineral fillers in aqueous suspension, ~~characterized in that it is~~ comprising a water soluble polymer with a controlled structure ~~and is~~ obtained by a controlled free radical polymerization method employing, as polymerization initiator, a particular alkoxyamine with the general formula (A):



where:

[[-]] R_1 and R_2 represent a linear or branched alkyl radical, with 1 to 5 carbon atoms,

[[-]] R_3 is a hydrogen atom, a linear or branched alkyl radical with 1 to 8 carbon atoms, a phenyl radical, a cation such as Li^+, Na^+, K^+, H_4N^+, Bu_3HN^+ with Bu = butyl,

[[-]] R_4 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical,

[[-]] R_5 is a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably a tertbutyl radical, and

[[-]] R_6 and R_7 represent a linear or branched alkyl radical with 1 to 8 carbon atoms, and preferably an ethyl radical.

Claim 14 (Currently Amended): The grinding aid agent for pigments and/or mineral fillers in aqueous suspension, according to claim 13, ~~characterized in that~~ wherein R_1 and R_2 represent the methyl radical and R_3 is the hydrogen atom.

Claim 15 (Currently Amended): The grinding aid agent for pigments and/or mineral fillers in aqueous suspension, according to ~~either one of claims 13 or 14, characterized in that~~ claim 13, wherein said polymer is a water soluble copolymer and has a random, block, comb, graft, or alternating type of structure.

Claim 16 (Currently Amended): The grinding aid agent for pigments and/or mineral fillers in aqueous suspension, according to ~~any one of claims 13 to 15, characterized in that~~ claim 13, wherein said water soluble polymer is obtained by the controlled free radical polymerization of monomers selected from:

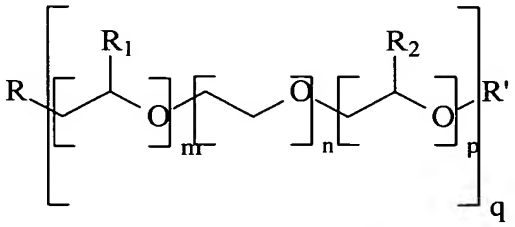
a) at least one ionic monomer, which is either

i) anionic and with a carboxylic or dicarboxylic or phosphoric or phosphonic or sulfonic function or mixture thereof, or

ii) cationic, or

iii) the mixture of i) and ii)

b) and ~~possibly~~ optionally at least one nonionic monomer, the nonionic monomer consisting of at least one monomer with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer or mixtures thereof,

d) and possibly at least one cross-linking monomer, or the mixture of a plurality of these monomers.

Claim 17 (Currently Amended): The grinding aid agent for pigments and/or mineral fillers in aqueous suspension, according to ~~any one of claims 13 to 16, characterized in that~~ claim 13, wherein said water soluble polymer is obtained by the controlled free radical polymerization of monomers selected more particularly from:

a) at least one ionic monomer which is either

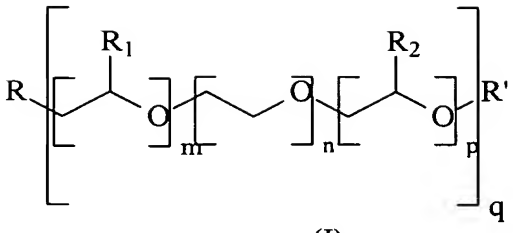
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or carboxylic acid anhydrides, such as maleic anhydride or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-

methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl sulfonic acid and styrene sulfonic acid, or even selected from monomers with ethylenic unsaturation and with phosphoric function in the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) cationic selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers

b) and ~~possibly~~ optionally at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

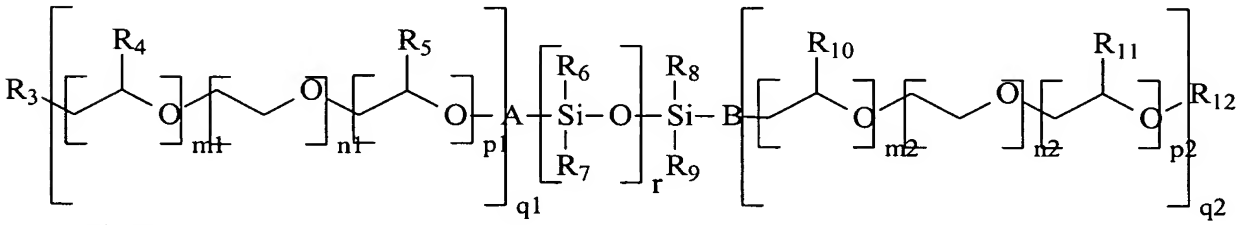
[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) and ~~possibly~~ optionally at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane,

allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms,

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si\ (OB)_3$$

where:

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

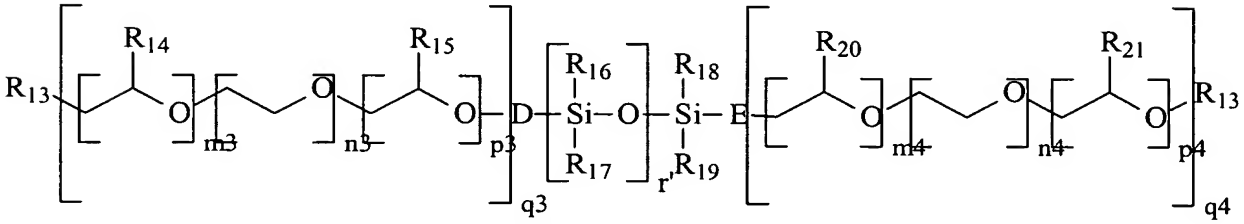
[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) and ~~possibly~~ optionally at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate,

trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III) :



(III)

where:

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 18 (Currently Amended): The grinding aid agent for pigments and/or mineral fillers, according to ~~one of claims 13 to 17, characterized in that~~ claim 13, wherein said water soluble polymer consists of, expressed by weight:

a) 2% to 100% and even more particularly 5% to 100% of at least one ionic monomer, which is either

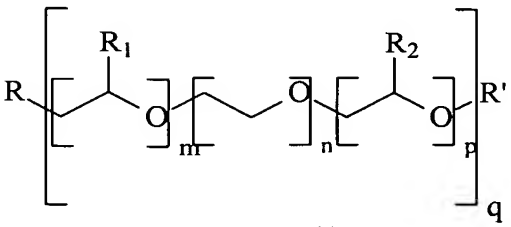
i) anionic with ethylenic unsaturation and with a monocarboxylic function in the acidic or salified state selected from monomers with ethylenic unsaturation and with monocarboxylic function such as acrylic or methacrylic acid or diacid hemiesters such as the C_1 to C_4 monoesters of maleic or itaconic acids, or selected from the monomers with ethylenic unsaturation and dicarboxylic function in the acidic or salified state such as crotonic, isocrotonic, cinnamic, itaconic, maleic acid, or carboxylic acid anhydrides, such as maleic anhydride or selected from monomers with ethylenic unsaturation and with a sulfonic function in the acidic or salified state such as acrylamido-methyl-propane-sulfonic acid, sodium methallylsulfonate, vinyl sulfonic acid and styrene sulfonic acid, or even selected from monomers with ethylenic unsaturation and with phosphoric function in

the acidic or salified state such as vinyl phosphoric acid, ethylene glycol methacrylate phosphate, propylene glycol methacrylate phosphate, ethylene glycol acrylate phosphate, propylene glycol acrylate phosphate and ethoxylates thereof or even selected from monomers with ethylenic unsaturation and with phosphonic function in the acidic or salified state such as vinyl phosphonic acid or mixtures thereof, or

ii) selected from N-[3-(dimethylamino) propyl] acrylamide or N-[3-(dimethylamino) propyl] methacrylamide, unsaturated esters such as N-[2-(dimethylamino) ethyl] methacrylate, or N-[2-(dimethylamino) ethyl] acrylate, or from quaternary ammoniums such as [2-(methacryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [2-(acryloyloxy) ethyl] trimethyl ammonium chloride or sulfate, [3-(acrylamido) propyl] trimethyl ammonium chloride or sulfate, dimethyl diallyl ammonium chloride or sulfate, [3-(methacrylamido) propyl] trimethyl ammonium chloride or sulfate, or mixtures thereof, or

iii) the mixture of at least one of the above anionic monomers with at least one of the above cationic monomers,

b) 0 to 98% and even or particularly 0% to 96% of at least one monomer with nonionic ethylenic unsaturation with the formula (I):



(I)

where:

[[-]] m and p represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n is a number of ethylene oxide motifs less than or equal to 150,

[[-]] q is a whole number at least equal to 1 and such that $5 \leq (m+n+p)q \leq 150$, and preferably such that $15 \leq (m+n+p)q \leq 120$,

[[-]] R_1 is the hydrogen or the methyl or ethyl radical,

[[-]] R_2 is the hydrogen or the methyl or ethyl radical,

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides, and

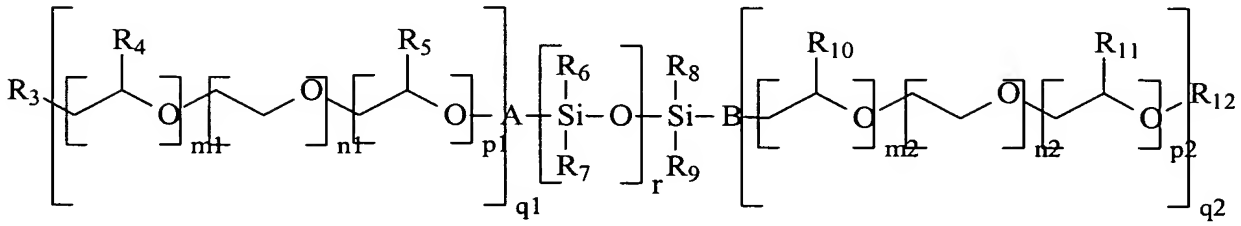
[[-]] R' is the hydrogen or a hydrocarbon radical with 1 to 40 carbon atoms, and is preferably a hydrocarbon radical with 1 to 12 carbon atoms and very preferably a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of monomers with the formula (I),

c) 0% to 50% of at least one monomer of the acrylamide or methacrylamide type and mixtures thereof, or at least one non water soluble monomer such as the alkyl acrylates or methacrylates, the vinyl esters such as vinyl acetate, vinylpyrrolidone, styrene, alphamethylstyrene and derivatives thereof, or at

least one organofluorine or organosilicon monomer selected preferably from the molecules with formulas (IIa) or (IIb):

with formula (IIa)



where:

[[-]] m1, p1, m2 and p2 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n1 and n2 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q1 and q2 represent a whole number at least equal to 1 and such that $0 \leq (m1+n1+p1)q1 \leq 150$ and $0 \leq (m2+n2+p2)q2 \leq 150$,

[[-]] r is a number such that $1 \leq r \leq 200$,

[[-]] R_3 is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_4, R_5, R_{10} and R_{11}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_6, R_7, R_8 and R_9, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof,

[[-]] R_{12} is a hydrocarbon radical with 1 to 40 carbon atoms, and

[[-]] A and B are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

with the formula (IIb)

$$R - A - Si\,(OB)_3$$

where:

[[-]] R is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

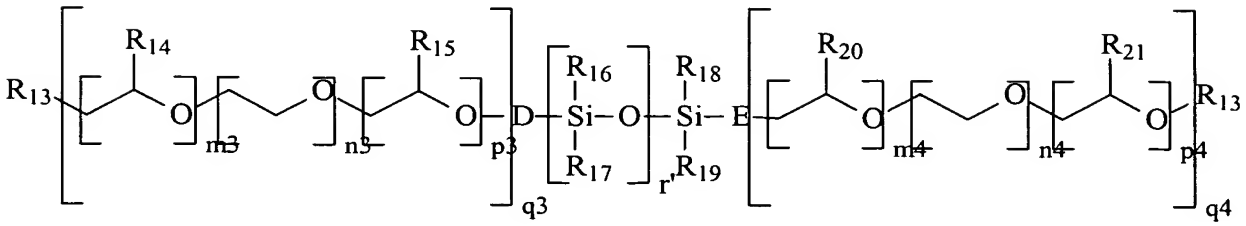
[[-]] A is a group that may be present, which then represents a hydrocarbon radical with 1 to 4 carbon atoms, and

[[-]] B is a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers,

d) 0 to 3% of at least one cross-linking monomer selected from the group consisting of ethylene glycol dimethacrylate, trimethylolpropanetriacrylate, allyl acrylate, allyl maleates, methylene-bis-acrylamide, methylene-bis-methacrylamide, tetrallyloxyethane, triallylcyanurates, allyl ethers obtained

from polyols such as pentaerythritol, sorbitol, sucrose, or selected from molecules with the formula (III) :



(III)

where:

[[-]] m3, p3, m4 and p4 represent a number of alkylene oxide motifs less than or equal to 150,

[[-]] n3 and n4 represent a number of ethylene oxide motifs less than or equal to 150,

[[-]] q3 and q4 represent a whole number at least equal to 1 and such that $0 \leq (m3+n3+p3)q3 \leq 150$ and $0 \leq (m4+n4+p4)q4 \leq 150$,

[[-]] r' is a number such that $1 \leq r' \leq 200$,

[[-]] R_{13} is a radical containing a polymerizable unsaturated function, preferably belonging to the vinyl group and to the group of acrylic, methacrylic, maleic, itaconic, crotonic, vinylphthalic esters and to the group of unsaturated urethanes such as acrylurethane, methacrylurethane, α-α' dimethyl-isopropenyl-benzylurethane, allylurethane, and also to the group of allyl or vinyl ethers, substituted or not, or to the group of ethylenically unsaturated amides or imides,

[[-]] R_{14}, R_{15}, R_{20} and R_{21}, represent hydrogen or the methyl or ethyl radical,

[[-]] R_{16}, R_{17}, R_{18} and R_{19}, represent linear or branched alkyl, or aryl, or alkylaryl, or arylalkyl groups with 1 to 20 carbon atoms, or mixtures thereof, and

[[-]] D and E are groups that may be present, which then represent a hydrocarbon radical with 1 to 4 carbon atoms,

or the mixture of a plurality of these monomers.

Claim 19 (Canceled).

Claim 20 (Currently Amended): The method for dispersing pigments and/or mineral fillers in aqueous suspension according to claim ~~19, characterized in that~~ 1, wherein 0.05 to 5% by dry weight of said polymer is used, and more particularly 0.1 to 3% by dry weight of said polymer is used, with respect to the dry weight of pigments and/or mineral fillers.

Claim 21 (Currently Amended): The method for dispersing pigments and/or mineral fillers according to ~~either one of claims 19 or 20, characterized in that~~ claim 20, wherein the pigment and/or mineral fillers are selected from natural or synthetic calcium carbonate, dolomites, kaolonite, talc, cement, gypsum, lime, magnesia, titanium oxide, satin white, aluminum trioxide or even aluminum trihydroxide, silicas, mica and the mixture of these fillers together, such as the talc-calcium carbonate, calcium carbonate-kaolinite mixtures, or even mixtures of calcium carbonate with aluminum trihydroxide or aluminum trioxide, or even mixtures with synthetic or natural fibers or even co-structures of minerals such as the talc-calcium carbonate or talc-titanium dioxide co-structures or mixtures thereof, and more particularly from natural calcium carbonate, synthetic calcium carbonate, and cement and very particularly from marble, calcite, chalk or mixtures thereof.

Claim 22 (Currently Amended): A method for grinding pigments and/or mineral fillers ~~characterized in that the water soluble polymer according to one of claims 1 to 6 is used~~ comprising grinding pigments and/or mineral fillers in the presence of a water soluble copolymer of claim 1.

Claim 23 (Currently Amended): The method for grinding pigments and/or mineral fillers in aqueous suspension according to ~~either one of claims 21 or 22, characterized in that~~ claim 22, wherein 0.05 to 5% by dry weight of said polymer is used, and more particularly 0.1 to 3% by dry weight of said polymer is used, with respect to the dry weight of pigments and/or mineral fillers.

Claim 24 (Currently Amended): The method for grinding pigments and/or mineral fillers according to ~~either one of claims 22 or 23, characterized in that~~ claim 22, wherein the pigment and/or mineral fillers are selected from natural or synthetic calcium carbonate, dolomites, kaolonite, talc, gypsum, lime, magnesia, titanium oxide, satin white, aluminum trioxide or even aluminum trihydroxide, silicas, mica and the mixture of these fillers together, such as the talc-calcium carbonate, calcium carbonate-kaolinite mixtures, or even mixtures of calcium carbonate with aluminum trihydroxide or aluminum trioxide, or even mixtures with synthetic or natural fibers or even co-structures of minerals such as the talc-calcium carbonate or talc-titanium dioxide co-structures or mixtures thereof, and more particularly from natural calcium carbonate, synthetic calcium carbonate, and very particularly from marble, calcite, chalk or mixtures thereof.

Claim 25 (Currently Amended): An aqueous dispersion of pigments and/or mineral fillers ~~characterized in that it contains~~ comprising the water soluble polymer according to ~~one of claims 1 to 6~~ claim 1, and more particularly in that it contains 0.05 to 5% by dry weight of said polymer, and more particularly in that it contains 0.1 to 3% by dry weight of said polymer, with respect to the dry weight of pigments and/or mineral fillers.

Claim 26 (Currently Amended): The aqueous dispersion of pigments and/or mineral fillers according to claim 25, ~~characterized in that~~ wherein the pigments and/or mineral fillers are selected from natural or synthetic calcium carbonate, dolomites, kaolonite, talc, cement, gypsum, lime, magnesia, titanium oxide, satin white, aluminum trioxide or even aluminum trihydroxide, silicas, mica and the mixture of these fillers together, such as the talc-calcium carbonate, calcium carbonate-kaolinite mixtures, or even mixtures of calcium carbonate with aluminum trihydroxide or aluminum trioxide, or even mixtures with synthetic or natural fibers or even co-structures of minerals such as the talc-calcium carbonate or talc-titanium dioxide co-structures or mixtures thereof, and more particularly from natural calcium carbonate, synthetic calcium carbonate, and very particularly from marble, calcite, chalk or mixtures thereof.

Claim 27 (Currently Amended): An aqueous suspension of ground pigments and/or mineral fillers ~~characterized in that it contains~~ comprising the water soluble polymer according to ~~one of claims 1 to 6~~ claim 1, and more particularly in that it contains 0.05 to 5% by dry weight of said polymer, and more particularly in that it contains 0.1 to 3% by dry weight of said polymer, with respect to the dry weight of pigments and/or mineral fillers.

Claim 28 (Currently Amended): The aqueous suspension of ground pigments and/or mineral fillers according to claim 27, ~~characterized in that~~ wherein the pigment and/or mineral fillers are selected from natural or synthetic calcium carbonate, dolomites, kaolonite, talc, gypsum, lime, magnesia, titanium oxide, satin white, aluminum trioxide or even aluminum trihydroxide, silicas, mica and the mixture of these fillers together, such as the talc-calcium carbonate, calcium carbonate-kaolinite mixtures, or even mixtures of calcium carbonate with aluminum trihydroxide or aluminum trioxide, or even mixtures with synthetic or natural fibers or even co-structures of minerals such as the talc-calcium carbonate or talc-titanium dioxide co-structures or mixtures thereof, and more particularly from natural calcium carbonate, synthetic calcium carbonate, and very particularly from marble, calcite, chalk or mixtures thereof.

Claim 29 (Currently Amended): ~~The use of aqueous dispersions of pigments and/or mineral fillers according to either one of claims 25 or 26 in the paper field such as the coating and bulk filling of the~~ A paper, water based paints, plastics, cement, ceramics [[and]] or detergents comprising the aqueous dispersion of pigments and/or mineral fillers according to claim 25.

Claim 30 (Currently Amended): ~~The use of aqueous suspensions of ground pigments and/ or mineral fillers according to either one of claims 27 or 28 in the paper field such as the coating and filling of the~~ A paper, water based paints, plastics, cement, ceramics [[and]] or detergents comprising the aqueous suspension of ground pigments and/or mineral fillers according to claim 27.

Claim 31 (Currently Amended): A method for dispersing mineral matter in a paper formulation, in a water based paint, in a cement, in a ceramic composition, in a detergent composition, in a drilling mud, ~~characterized in that~~ comprising including therein the water soluble polymer according to ~~one of claims 1 to 6 is used~~ claim 1.

Claim 32 (Canceled).

Claim 33 (Currently Amended): A paper formulation containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 34 (Currently Amended): A water based paint containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 35 (Currently Amended): A plastic composition containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~anyone of Claims 1 to 6 and 32~~ claim 1.

Claim 36 (Currently Amended): A cement containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 37 (Currently Amended): A ceramic composition containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 38 (Currently Amended): A detergent composition containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 39 (Currently Amended): A cosmetic composition containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.

Claim 40 (Currently Amended): A drilling mud composition containing 0.01 to 5% by dry weight of the water soluble polymer ~~put into practice~~ according to ~~any one of claims 1 to 6 and 32~~ claim 1.